

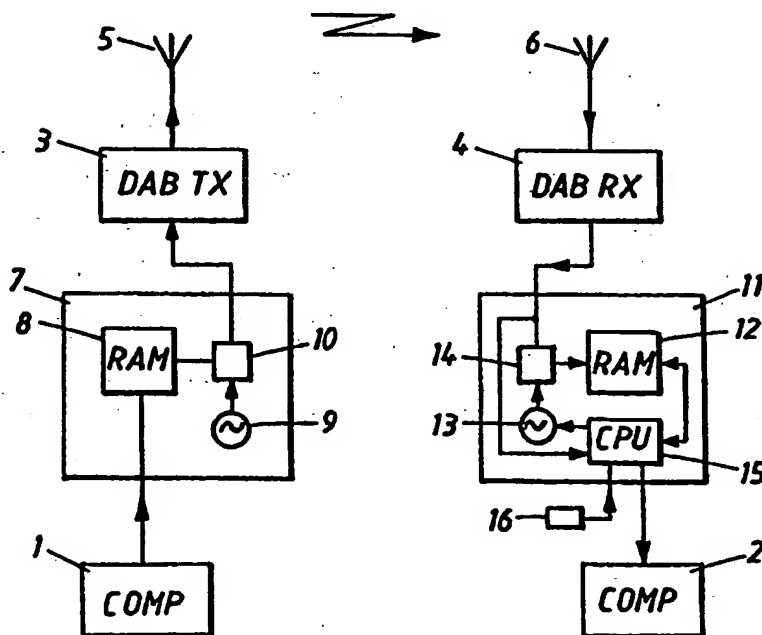


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>H04H 1/00</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 99/25083</b> <b>(43) International Publication Date:</b> 20 May 1999 (20.05.99)
<b>(21) International Application Number:</b> PCT/SE98/00842 <b>(22) International Filing Date:</b> 7 May 1998 (07.05.98) <b>(30) Priority Data:</b> 9704101-6 10 November 1997 (10.11.97) SE <b>(71) Applicant (for all designated States except US):</b> DOBORA COMMUNICATION AB [SE/SE]; P.O. Box 152, S-132 25 Saltsjö-Boo (SE). <b>(72) Inventor; and</b> <b>(75) Inventor/Applicant (for US only):</b> WAHLSTEN, Gunnar [SE/SE]; Ringvägen 9A, S-118 23 Stockholm (SE). <b>(74) Agents:</b> ÖRTENBLAD, Bertil et al.; Noréns Patentbyrå AB, P.O. Box 10198, S-100 55 Stockholm (SE).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** A METHOD AND ARRANGEMENT FOR WIRELESS DATA TRANSMISSION**(57) Abstract**

A method for the wireless transmission of data between one computer and one or more other computers with the aid of the DAB system or a corresponding system for the wireless transmission of digital data, where the transmitting computer is connected to a DAB transmitter and where the receiving computer or computers is/are connected to a respective DAB receiver. The invention is characterized in that information that is outputted intermittently from the transmitting computer (1) is stored intermediately in a memory (8) of a first adaptation circuit (7) between the transmitting computer (1) and the DAB transmitter (3); in that information is outputted essentially continuously from said memory (8) to said DAB transmitter (3) under the control of an outfeed oscillator (9) in the adaptation circuit; in that transmitted information is received by a DAB receiver (4) and fed into a memory (12) in a second adaptation circuit (11) under the control of an infeed oscillator (13) in the second adaptation circuit (11); in that the two oscillators (9, 13) operate on mutually the same frequency or essentially the same frequency; and in that the receiving computer (2) is caused to fetch information intermittently from the memory (12) in the second adaptation circuit (11). The invention also relates to an arrangement for carrying out the method.



## A METHOD AND ARRANGEMENT FOR WIRELESS DATA TRANSMISSION

The present invention relates to a method and to an arrangement for wireless, data transmission. More specifically, the invention relates to the transmission of data by digital broadcasting transmissions.

The present invention relates primarily to a method and to an arrangement for transmitting data from one computer to one or more other computers with the aid of a radio transmitter and one or more receivers, so as to enable data to be transmitted in applications using equipment produced in accordance with the international standard DAB (Digital Audio Broadcast).

This standard DAB is described in prETS 300 401 radio Broadcasting Systems; Digital Audio Broadcasting (DAB) to mobile, portable and fixed receivers, February, 1997. The invention is not limited to this standard, however, but can be applied equally as well with digital radio transmissions according to some other standard.

Frequencies are at present allotted to land-based DAB transmissions over the whole of Europe. The frequency spaces primarily used are TV channels in VHF band 111. Each DAB channel can transmit 2.304 Mbit/s gross, which corresponds, for instance, from five to six high-quality stereo programmes.

The modulation and signal processing technique chosen in accordance with the DAB standard is COFDM (Coded Orthogonal Frequency Division Multiplex), which enables all transmitters in a region-covering network to send the same signals on the

limited transmission requirement in the form of packet switched data quantities in a simpler case, or for the highest data rate of up to 2 Mbit/s when the entire ensemble is disposed for data transmission in a stream mode.

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According to the foregoing, the DAB system should be capable of transmitting digital data from one computer to one or more other computers, at a rate of up to 1.5 Mbit/s.

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One serious problem in this regard, however, is that a computer is not designed to receive a more or less continuous DAB data stream, since a computer that typically includes the standardized PCI bus is designed to perform PCI bus transactions in the form of bursts.

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The present invention solves this problem and enables data to be transferred between computers with the aid of the DAB system.

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Many computers are, at present, connected to cable networks or tele-networks for the exchange of information between different computers. When several computers shall receive certain information from one computer, this latter computer must be connected to each of the other computers in an ordered sequence. This is both time-consuming and expensive.

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The cost of transmitting ether-carried information with the aid of the present invention can be drastically reduced while many receivers can be reached simultaneously.

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An example of one application is found in the transmission of price information from a wholesaler in the daily commerce to

adaptation circuit, between the transmitting computer and the DAB transmitter, in that information is fed from said memory to the DAB transmitter essentially continuously under the control of an outfeed oscillator in the adaptation circuit, in that transmitted information is received by a DAB receiver and fed into a memory in a second adaptation circuit under the control of an input oscillator in said second adaptation circuit, in that the two oscillators operate on the same or essentially the same frequency, and in that the receiving computer is caused to take information intermittently from the memory store in the second adaptation circuit.

The invention also relates to an arrangement that has the main features defined in Claim 5.

15

The present invention will now be described in more detail with reference to exemplifying embodiments thereof and also with reference to the accompany drawing, in which Figure 1 is a block schematic illustrating a transmitter side and a receiver side.

20

Shown in the Figure is an arrangement for the wireless transmission of data between a computer 1 and one or more other computers 2 with the aid of the DAB system or a corresponding system for the wireless transmission of digital data. Such a corresponding system may be a system for digital TV transmissions. The transmitting computer 1 is connected to a known DAB transmitter 3 that has a transmitter antenna 5. The receiving computer or computers 2 is/are connected to a respective known DAB receiver 4 that has a receiver antenna 6.

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In one preferred embodiment, the oscillator 13 in the second adaptation circuit 11 is adapted to be synchronized with the oscillator 9 in the first adaptation circuit, by locking the frequency of the second oscillator 13 to a reference included in the received signal. This can be achieved by including in the second adaptation circuit 11 a microprocessor 15 that functions to detect the signal received by the DAB receiver and to decode a predetermined part of said received signal that constitutes said reference and therewith activate the oscillator 13.

In one preferred embodiment, the microprocessor 15 is adapted to determine from a FIC (Fast Information Channel) in the DAB system those parts of the received signal that contain data. The microprocessor is also adapted to store received data in the memory 12 of said adaptation circuit.

In one embodiment, the microprocessor 15 includes software that causes the received information to be structured and stored in the memory 12 in a form that enables a standard PC 2 to fetch information from the memory 12. Alternatively, the software can be installed in the personal computer, PC.

In one highly preferred embodiment, the microprocessor 15 in the second adaptation circuit 11 is adapted to identify information that is relevant to the receiving computer 2 and that includes identification of address information and possibly also authorization.

It is thus possible to address one or more of all computers that are connected to a DAB receiver 4.

in an essentially continuous form, and is fed into the memory in the second adaptation circuit 11 under the control of the infeed oscillator 13. The receiving computer is then caused to fetch information intermittently from the memory in the  
5 second adaptation circuit.

The present invention thus enables information to be transmitted via the DAB system, or some corresponding system for the wireless transmission of data, at high speed and in a  
10 more or less continuous form between standard computers, such as typical personal computers, PCs, which are not constructed to output and input data essentially continuously but, instead, constructed to output and input information in bursts.

15 The present invention thus solves the problem mentioned in the introduction.

Adaptation circuits 7, 11 have been described in the  
20 foregoing. These circuits may be physically separate units or may comprise an electronic card that can be mounted in a PC or some other computer. Naturally, the invention does not solely apply to personal computers and can be applied to all types of computers.

25 The adaptation circuit may, of course, be constructed in many different ways for achieving the aforescribed function. It will be obvious to the person skilled in this art that the structural design of the adaptation circuits can vary.

30 The present invention is thus not limited to the aforescribed exemplifying embodiments thereof since

## CLAIMS

1. A method for the wireless transmission of data between one computer and one or more other computers with the aid of the DAB system or a corresponding system for the wireless transmission of digital data, where the transmitting computer is connected to a DAB transmitter and where the receiving computer or computers is/are connected to a respective DAB receiver, characterized in that information that is outputted intermittently from the transmitting computer (1) is stored intermediately in a memory (8) of a first adaptation circuit (7) between the transmitting computer (1) and the DAB transmitter (3); in that information is outputted essentially continuously from said memory (8) to said DAB transmitter (3) under the control of an outfeed oscillator (9) in the adaptation circuit; in that transmitted information is received by a DAB receiver (4) and fed into a memory (12) in a second adaptation circuit (11) under the control of an infeed oscillator (13) in the second adaptation circuit (11); in that the two oscillators (9, 13) operate on mutually the same frequency or essentially the same frequency; and in that the receiving computer (2) is caused to fetch information intermittently from the memory (12) in the second adaptation circuit (11).

25

2. A method according to Claim 1, characterized in that the oscillator (13) in the second adaptation circuit (11) is caused to be synchronized with the oscillator (9) in the first adaptation circuit (7), by locking the frequency of the second oscillator (13) onto a reference included in the received signal.

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second adaptation circuit (11) being adapted to input information received by the DAB receiver (4) into a memory (12) in the second adaptation circuit (11) under the control of an infeed oscillator (13) in said second adaptation circuit (11); in that the two oscillators (9, 13) operate at the same or essentially the same frequency; and in that the receiving computer (2) is adapted to fetch information intermittently from the memory (12) in the second adaptation circuit (11).

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6. An arrangement according to Claim 5, characterized in that the oscillator (13) in the second adaptation circuit (11) is intended to be synchronized with the oscillator (9) in the first adaptation circuit (7), by locking the frequency of the second oscillator (13) to a reference included in the received signal.

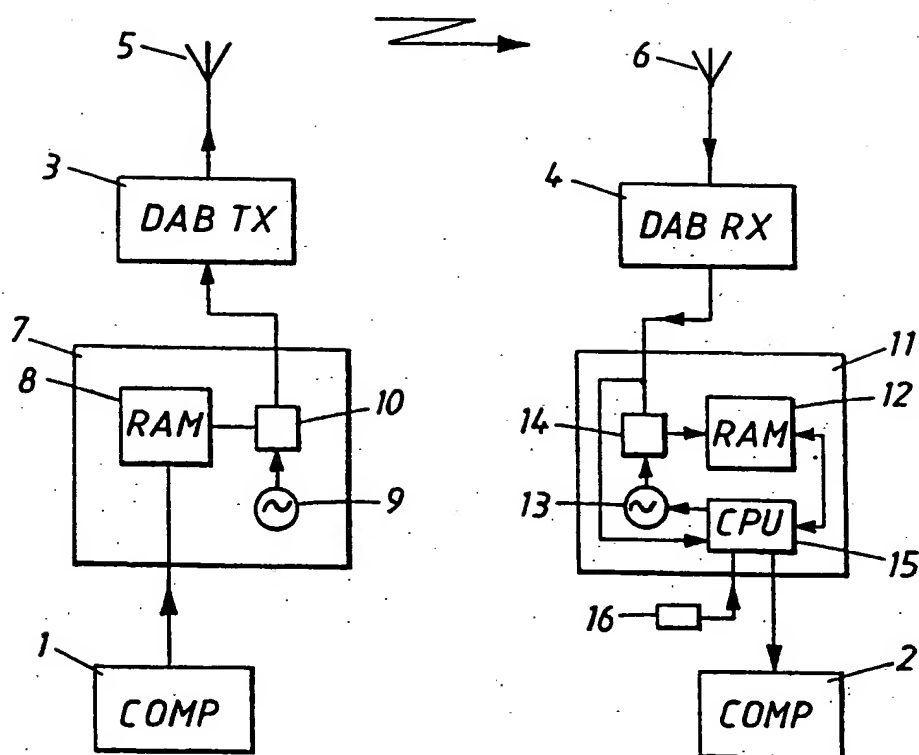
7. An arrangement according to Claim 5 or 6, characterized in that the second adaptation circuit (11) includes a microprocessor (15) which is adapted to decide from a fast information channel (FIC) in the DAB system which parts of the received signal contain data, and to store received data in the memory (12) of the second adaptation circuit (11).

8. An arrangement according to Claim 7, characterized in that the microprocessor (15) in the second adaptation circuit (11) is adapted to identify information that is relevant to receiving computer (2) and that includes identification of address information and possibly also authorization.



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Fig. 1



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/00842

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04H 1/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04H, G06F, H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5132989 A (GILLES BELLON), 21 July 1992 (21.07.92), column 1, line 16 - line 17; column 2, line 65 - column 3, line 32, figure 4 --	1-3,5-7
Y	Serge Fdida, Michele Morganti, "European Conference on Multimedia Applications, Services and Techniques - ECMAST' 97, May 21-23", 1997, ., (Milan, Italy), page 593 - page 607, see the whole document --	1-3,5-7
P,A	GB 2313981 A (ROKE MANOR RESEACH LIMITED), 10 December 1997 (10.12.97), page 2, line 19 - page 3, line 2; page 5, line 18 - page 6, line 18; page 9, line 21 - page 10, line 20, figure 1, claims 1,4 --	1-3,5-7

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

6 Sept 1998

11-09-1998

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